

CLAIMS

What is claimed is:

1. A method of operating a communications system, the  
5       communications system including a plurality of nodes  
interconnected by a plurality of communications paths to  
form at least one communications network, the plurality  
of communications paths including at least one control  
path for carrying out-of-band control information between  
10      at least two of the plurality of nodes and at least one  
corresponding data path for transferring data between the  
at least two nodes, the method comprising the steps of:  
          determining whether the control path is in an  
operational state or a non-operational state;  
15      in the event the control path is in the non-  
operational state, determining whether a forwarding state  
defining a data transmission channel along the  
corresponding data path is established;  
          in the event the forwarding state defining the data  
20      transmission channel is not established, tearing-down the  
data transmission channel along the data path; and  
          in the event the forwarding state defining the data  
transmission channel is established, maintaining the data  
25      transmission channel along the data path.
2. The method of claim 1 wherein the communications  
network has a ring topology.
3. The method of claim 1 wherein the first determining  
30      step comprises:

sending a first control message from a first node to a second node;

5       in the event a second control message is not received at the first node from the second node in response to the first control message before the expiration of a predetermined time interval, providing an indication that the control path is in the non-operational state; and

10      in the event the second control message is received at the first node before the expiration of the predetermined time interval, providing an indication that the control path is in the operational state.

15      4. The method of claim 3 wherein the first control message and the second control message conform to messages within a predetermined protocol.

20      5. The method of claim 4 wherein the first control message and the second control message are operative to refresh a reservation along a label switched path between the first node and the second node.

25      6. A method of operating a communications system, the communications system including a plurality of nodes interconnected by a plurality of communications paths to form at least one communications network, the method comprising the steps of:

detecting at least one change in the topology of the communications network;

in the event the detected change includes the removal of a node connected to a first communications path, determining whether the removed node comprises an ingress node or an egress node of the first communications path;

in the event the removed node comprises the ingress node or the egress node of the first communications path, tearing-down a data transmission channel along the first communications path between the ingress node and the egress node; and

in the event the removed node does not comprise the ingress node or the egress node of the first communications path, maintaining the data transmission channel along the first communications path between the ingress node and the egress node.

7. The method of claim 6 wherein the communications network is a Multiple Protocol Label Switching based network.

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8. The method of claim 7 wherein the tearing-down step comprises modifying a label switching forwarding table maintained by at least one node coupled to the first communications path.

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9. A method of operating a communications system, the communications system including a plurality of nodes interconnected by a plurality of communications paths to form at least one communications network, the method comprising the steps of:

detecting at least one change in the topology of the communications network by a first node connected to a first communications path;

5       in the event the detected change includes the addition of a node to the first communications path or the removal of a node from the first communications path, determining whether the first node comprises an ingress node of the first communications path; and

10      in the event the first node comprises the ingress node of the first communications path, reestablishing a data transmission channel along the first communications path by the first node.

15      10. The method of claim 9 wherein the communications network is a Multiple Protocol Label Switching based network.

20      11. The method of claim 10 wherein the reestablishing step comprises programming a forwarding state of the data transmission channel along the first communications path.

25      12. A communications system, comprising:  
          a plurality of nodes; and  
          a plurality of communications paths interconnecting the plurality of nodes to form at least one communications network, the plurality of communications paths including at least one control path for carrying out-of-band control information between at least two of the plurality of nodes and at least one corresponding

data path for transferring data between the at least two nodes,

wherein the at least two nodes comprise a software configuration including a protocol manager operative to determine whether the control path is in an operational state or a non-operational state, in the event the control path is in the non-operational state being further operative to determine whether a data transmission channel along the corresponding data path is established, in the event the data transmission channel is not established being further operative to tear-down the data transmission channel along the data path, and in the event the data transmission channel is established being further operative to maintain the data transmission channel along the data path.

13. The system of claim 12 wherein the communications network has a ring topology.